

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-20 are pending in this case. Claim 8 is amended only to correct dependency and, thus, no new matter is added.

In the outstanding Office Action, Claim 8 was objected to; Claims 1-3, 10, 14, and 17-20 were rejected under 35 U.S.C. § 103(a) as unpatentable over Flatte, et al. (U.S. Pub. No. 2003/0209770, herein “Flatte”) in view of Zhu, et al. (U.S. Patent No. 5,768,181, herein “Zhu”); Claim 4 was rejected under 35 U.S.C. § 103(a) as unpatentable over Flatte in view of Zhu, further in view of Chang, et al. (U.S. Patent No. 5,294,287, herein “Chang”); Claims 5, 11, and 13 were rejected under 35 U.S.C. § 103(a) as unpatentable over Flatte in view of Zhu, further in view of Chang and Wang, et al. (U.S. Patent No. 6,713,195, herein “Wang”); Claim 6 was rejected under 35 U.S.C. § 103(a) as unpatentable over Flatte in view of Zhu, further in view of Chang, Wang, and Grollier, et al. (“Switching a spin valve back and forth by current-induced domain wall motion”, herein “Grollier”); Claims 7-9, 15, and 16 were rejected under 35 U.S.C. § 103(a) as unpatentable over Flatte in view of Zhu, further in view of Zhu, et al. (U.S. Patent No. 5,734,605, herein “Zhu2”); and Claim 12 was rejected under 35 U.S.C. § 103(a) as unpatentable over Flatte in view of Zhu, further in view of Wang.

In light of the amendment to Claim 8, Applicants respectfully request that the objection to Claim 8 be withdrawn.

Applicants respectfully traverse the rejections of the pending claims under 35 U.S.C. § 103.

With regard to Claim 1, the outstanding Office Action asserts Flatte as teaching every element except “a second magnetic body with a magnetization direction antiparallel to that of the first magnetic body” which it asserts Zhu as teaching.

However, the third semiconductor region of Flatte, which, along with the first semiconductor region and two depletion layers, sandwiches the second semiconductor region of Flatte, cannot properly be modified by Zhu to have a spin polarization opposite to that of the first semiconductor region.

When a combination of references is asserted as teaching every element of a claim, both the asserted modification, or how the references are combined, as well as the asserted motivation for the combination, or why one of ordinary skill in the art would combine the references, must be specified in the rejection. MPEP § 706.02(V) sets out the requirement for asserting the modification. As to the asserted motivation, the Court recently reiterated the requirement of MPEP § 2143.01 by stating that a “patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art.” KSR Int. Co. v. Teleflex Inc., 82 USPQ2d 1385, 1389 (2007). The Court stated the importance of identifying “a reason that would have prompted a person of ordinary skill in the art to combine the elements as the new invention does.” *Id.*

Further, under MPEP § 2143.01(V) the proposed modification cannot render the prior art unsatisfactory for its intended purpose, and, under MPEP § 2143.01(VI), the proposed modification cannot change the principle of operation of the prior art.

In this case, Flatte describes a unipolar spin transistor and, in every instance in which the first and third spin polarizations are described, such as at paragraphs [0073] and [0086], for example, Flatte specifies that the first and third spin polarizations must be the same. More significantly, if the first and third semiconductor regions of Flatte have opposite spin polarizations, the majority carrier in the first semiconductor region could not move across both depletion layers, as described at paragraph [0023], for example. The principle of operation of Flatte would be changed by the proposed modification with Zhu, and, thus, the modification cannot properly be made to establish a *prima facie* case of obviousness.

Further, even if, *arguendo*, Flatte could be modified by Zhu, which it cannot, neither Flatte nor Zhu teaches or suggests at least “the magnetization direction of the device is controlled in such a manner that a current is applied across microjunction interfaces...such that a magnetic domain wall is moved by the interaction between the magnetic domain wall and the current,” as recited by Claim 1.

Flatte describes, at paragraph [0083] that voltages V_{EB} and V_{CB} cause carriers to move across semiconductor regions. However, as clarified by paragraph [0084] of Flatte, a local **external magnetic field is used to control magnetization** and change the voltage-current relation of the device so that Flatte does not teach “the magnetization direction of the device is **controlled in such a manner that a current is applied** across microjunction interfaces...**such that a magnetic domain wall is moved by the interaction between the magnetic domain wall and the current,**” as recited by Claim 1.

Zhu does not cure the deficiencies of Flatte with regard to the above-discussed features of Claim 1 and is not asserted to teach the features.

Because Flatte and Zhu are not properly combined and also because, even in combination, Flatte and Zhu do not teach every feature of Claim 1, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) of Claim 1 and Claims 2, 3, 10, 14, and 17-20, which depend therefrom, be withdrawn.

Claims 4-9, 11-13, 15, and 16 depend from Claim 1 and, therefore, patentably define over the combination of Flatte and Zhu for at least the same reasons as Claim 1.

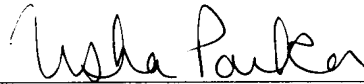
Further, because, as discussed above, Flatte cannot properly be modified to teach “a second magnetic body with a magnetization direction antiparallel to that of the first magnetic body,” as recited by Claim 1, the additional references asserted against Claims 4-9, 11-13, 15, and 16 - Chang, Wang, Grollier, and Zhu2 – cannot cure the deficiencies of the combination of Flatte and Zhu with regard to Claim 1.

Thus, Applicants respectfully request that the rejections under 35 U.S.C. § 103(a) of Claims 4-9, 11-13, 15, and 16 be withdrawn.

Accordingly, the outstanding rejections are traversed and the pending claims are believed to be in condition for formal allowance. An early and favorable action to that effect is, therefore, respectfully requested.

Respectfully submitted,

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